APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,905	12/23/2004	Carren ME Holden	540-543	1349

23117   7590   10/19/2007

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EXAMINER
THOMAS, MIA M

ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
10/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/518,905	HOLDEN ET AL.
	Examiner	Art Unit	
	Mia M. Thomas	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on <u>23 December 2004</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-14</u> is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-14</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>23 December 2004</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☒ All b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date <u>see attached</u>.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____ .

DETAILED ACTION

Priority

1.   Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2.   The abstract of the disclosure is objected to because "The sheet or sheets presenting the abstract may not include other parts of the application or other material," including the title of the invention and references to figures or drawings. MPEP 608.01(b) [R-3].

In addition, the abstract is also objected to accordingly with 37 C.F.R. 1.72 and MPEP 608.01 (b)..."A brief narrative of the disclosure as a whole in a single paragraph of *150 words or less* commencing on a separate sheet following the claims is required. Appropriate correction is required. See MPEP § 608.01(b).

3.   Examiner Suggestion: It is suggested that applicant write out acronyms as it applied to multiple forms of development and/or analysis. For example "DoE"-design of experiments- is written out in the background section of the application but similar acronyms are not spelled out throughout the specification. For example, "SOM, GTM, CFD, SQP". It would be helpful to mention the full spelling of these acronyms in the specification.

Response to Amendment

4.   This Office Action is responsive to the applicant's remarks received on 23 December 2004. Claims 1-14 remain pending.

The claims have been amended to eliminate multiple dependent claims, without prejudice. The specification has been amended to include a cross reference to the parent application. Examiner accepts the amendment to the claims and the specification and enters them on the record as outlined in the preliminary amendment for instant application 10/518,905.

Drawings

5.   The drawings are objected to under 37 CFR 1.83(a) because they fail to show appropriate contrast with respect to the details as captured in Figure 2, 10 and 11. There is a very poor contrast as is associated with the "Design Variables" in Figures 10 and 11. Additionally, for Figures 10 and 11, it is not readily apparent as to details with reference to the data gathered for each element (CD), and graph as related to Figure 11. Moreover, the writing inside the text of the data gathered at Figure 11, does not stand out against the contrast of the drawings...with respect and as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance. Appropriate correction is required.

Claim Rejections - 35 USC § 101

6.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 9, 10-12, and 14 are rejected under 35 U.S.C. 101. See below for detailed explanations.

Claim 10 is rejected because the claimed invention is directed to non-statutory subject matter. Claim 10 when read in light of the specification simply recites a reference to accompanying drawings, which when claims are examined, limitations from the specification are not to be read into the claims. Claim 10 has no practical applicability. In practical application, in cases of methods or processes, the claims must be able to be practiced, not merely described.

Note: Claim 10: "A method **substantially** as herein described with reference to the accompanying drawings." As to avoid issues with regards to 112, 2nd paragraph related rejections; applicant is reminded that the term **"substantially"** is often used in conjunction with another term to describe a particular characteristic of the claimed invention. The court held that the limitation "to substantially increase the efficiency of the compound as a copper extractant" was definite in view of the general guidelines contained in the specification. The court held that the limitation "which produces substantially equal E and H plane illumination patterns" was definite because one of ordinary skill in the art would know what was meant by "substantially equal." It is unclear that in light of the specification that one of ordinary skill in the art would be reasonably apprised as to the requisite degree of substantiality with regards to the method claimed in Claim 10.

Claim 14 is rejected because the claimed invention is directed to non-statutory subject matter.

Claim 14 when read in light of the specification simply recites a reference to accompanying

drawings, which when claims are examined, limitations from the specification are not to be read

into the claims. Claim 14 has no practical applicability. In practical application, in cases of a

machine or system, the claims must be able operable, not merely described.

Note: Claim 14 is also "A data processing system substantially as herein described with

reference to the accompanying drawings." The same notice as offered above with respect to

Claim 10 is also offered here at Claim 14.

Regarding Claims 11 and 12:

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject
Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional
> descriptive material." In this context, "functional descriptive material" consists of data structures and
> computer programs which impart functionality when employed as a computer component. (The
> definition of "data structure" is "a physical or logical relationship among data elements, designed to
> support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and
> Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited
> to music, literary works and a compilation or mere arrangement of data.
>
> When functional descriptive material is recorded on some computer-readable medium it becomes
> structurally and functionally interrelated to the medium and will be statutory in most cases since use of
> technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32
> F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a
> computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33
> F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in
> memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at
> 1760 (claim to a data structure per se held nonstatutory).
>
> In contrast, a claimed computer-readable medium encoded with a computer program is a computer
> element which defines structural and functional interrelationships between the computer program and
> the rest of the computer which permit the computer program's functionality to be realized, and is thus
> statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

Claims 11 and 12 are rejected under 35 U.S.C. 101 because the claimed invention is directed to

non-statutory subject matter as follows. Claim 11 defines a program code and Claim 12 defines

a carrier medium; embodying functional descriptive material. However, the claim does not

define a computer-readable medium or computer-readable memory and is thus non-statutory for

that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). The scope of the presently claimed invention encompasses products that are not necessarily computer readable, and thus NOT able to impart any functionality of the recited program. The examiner suggests amending the claim(s) to embody the program on "computer-readable medium" or equivalent; assuming the specification does NOT define the computer readable medium as a "signal", "carrier wave", or "transmission medium" which are deemed non-statutory (refer to "note" below). Any amendment to the claim should be commensurate with its corresponding disclosure.

Note:

A "signal" (or equivalent) embodying functional descriptive material is neither a process nor a product (i.e., a tangible "thing") and therefore does not fall within one of the four statutory classes of § 101. Rather, "signal" is a form of energy, in the absence of any physical structure or tangible material.

Should the full scope of the claim as properly read in light of the disclosure encompass non-statutory subject matter such as a "signal", the claim as a whole would be non-statutory. In the case where the specification defines the computer readable medium or memory as statutory tangible products such as a hard drive, ROM, RAM, etc, as well as a non-statutory entity such as a "signal", "carrier wave", or "transmission medium", the examiner suggests amending the claim to *include* the disclosed tangible computer readable media, while at the same time *excluding* the intangible media such as signals, carrier waves, etc.

Regarding Claim 9:

Claim 9 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without

setting forth any steps involved in the process, results in an improper definition of a process,

i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for

example *Ex parte Dunki*, 153 USPQ 678 (Bd. App. 1967) and *Clinical Products, Ltd.* v. *Brenner*,

255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Also see MPEP 2173.05(q). Appropriate correction is required.

Claim Rejections - 35 USC § 112

7.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter, which the applicant regards as his invention.

Claims 9, 10, 13 and 14 are rejected under 35 U.S.C. 112, second paragraph for the following

reasons:

8.   Claim 9 provides for the use of an application to an aircraft design or to an aerodynamic

surface design, but, since the claim does not set forth any steps involved in the method/process,

it is unclear what method/process applicant is intending to encompass. A claim is indefinite

where it merely recites a use without any active, positive steps delimiting how this use is

actually practiced.

9.   Claim 13 is rejected under 35 U.S.C. 112, second paragraph, because the claim lacks

structure. See MPEP § 2172.01. According to MPEP 2114, It shall be noted that, "While

features of an apparatus may be recited either structurally or functionally, claims directed to an

apparatus must be distinguished from the prior art in terms of structure rather than function." In

re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir.1997)

Given the lack of structure, it is not clear if applicant intends to claim an "apparatus". If the intent

is to claim an "apparatus", structure for claim 13 is needed.

10.   Claims 10 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite in that it fails to point out what is included or excluded by the claim language. This

claim is an omnibus type claim.

Also see MPEP 2173.05(r).

Claim Rejections - 35 USC § 102

11.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12.   Claims 1-3, 7, 11-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Kiang

et al, "An Evaluation of Self-Organizing Map Networks as a Robust Alternative to Factor

Analysis in Data Mining Applications, (hereinafter, Kiang).

Regarding Claims 1 and 2: Kiang discloses a method of transforming data from a high

dimensional to low dimensional design space ("The main function of SOM (Self-Organizing

Map) networks is to map the input data from an n-dimensional space to a lower dimensional

(usually one or two dimensional) plot while maintaining the original topological relations." page

180, section 3, Self-Organizing Map (SOM) Networks, first paragraph)

and deriving an optimum value(claim 1) / conditional value (claim 2) for a predetermined

function representative of the transformed data in the low-dimensional design space, ("The

network undergoes a self-organization process through a number of training cycles, starting with

randomly chosen w1s..." page 181, section 3, Subsection-The Self-Organization Process,

paragraph 1, left column);

which derivation is further effected in the low-dimensional design space in dependence upon an

inspection of the transformed data (Refer to Figure 1, specifically refer to the output layer and

the input layer. Also refer to equations 1a and 1b @ page 181.)

Regarding Claim 3: Kiang discloses a method as claimed in claim 1 wherein the value is

derived by (a) establishing a mathematical combination of a number of independent design

variables and dependent design variables relating to the function (Refer to Figure 1 and

equation 1a), and (b) modifying said combination in the low-dimensional design space to derive

therefrom the desired value for the function at which various constraints associated with the

function are satisfied and at which the function has a conditional high or low value in relation to

other possible values of the function which are determined in accordance with the modification

of said combination (Refer to Equation 1b-1d).

Regarding Claim 7: Kiang discloses a method as claimed in claim 3 wherein the data

transformation into the low-dimensional design space is performed in a manner that takes

account of the effect of each of the design variables relating to the function ("Across all

scenarios the number of observed variable (p) was fixed at eight, the number of segments

(clusters) at three, the number of latent factors (q) at two and the sample size ay 800...In all

scenarios, we specified factor-loading values so that the first four variables (x1-x4) has non zero

loadings only on one factor, and the remaining variables (x5-x8) had nonzero loadings only on

the other factor." at page 183, Section 4 "The Experimental Design", subsection Sample,

Generation", left column, paragraph 2, also for more examples, see Table 2).

Regarding Claim 11 (as best understood by the Examiner): Kiang discloses a program element

comprising program code operable to carry out a method as claimed in claim 1. ("As the first

step in this study, we implanted the algorithm in C++...page 184, Section 4 "The Experimental

Design", subsection "The Gamma Parameter", paragraph 3, right column).

Regarding Claim 12 (as best understood by the Examiner): Kiang discloses the program

element of claim 11 on a carrier medium ("The network training for the experiments was

performed on a cluster of IBM RS/6000 minicomputers. Version 6.11 of the SAS Statistical

package was used to run the factor analysis, ... page 184, Section 4 "The Experimental

Design", subsection "The Gamma Parameter", paragraph 3, right column). For clarification, a

mini-computer implicitly embodies a carrier medium.

Regarding Claim 13 (as best understood by the Examiner): Kiang discloses a data processing

system for transforming data from a high dimensional to low dimensional design space adapted

and arranged to carry out a method as claimed in claim 1 ("The data sets were generated using

SAS (to generate multinomial distributions corresponding to the segments) and PRELIS 2 (to

generate multivariate observations corresponding to an underlying factor model", page 184,

Section 4 "The Experimental Design", subsection "The Gamma Parameter", paragraph 3, right

column).

Claim Rejections - 35 USC § 103

13.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

14.   Claims 4-6, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kiang et

al, "An Evaluation of Self-Organizing Map Networks as a Robust Alternative to Factor Analysis

in Data Mining Applications" in combination with Bishop et al, "GTM: The Generative

Topographic Mapping", (hereinafter referred to as Bishop).

Regarding Claim 4:

Kiang discloses all of the limitations of the method as rejected above at Claim 1.

Kiang does not specifically disclose wherein said transformation into the low-dimensional design space is performed by application of a Generative Topographic Map (GTM) technique, as claimed.

Bishop teaches wherein said transformation into the low-dimensional design space is performed by application of a Generative Topographic Map (GTM) technique (Refer to Figure 1, page 3; GTM provides a principled alternative to the widely used (SOM) of Kohonen (1982)" at page 1, abstract).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to transform the low-dimensional design space by application of a Generative Topographic Map as taught by Bishop to the method of transformation as disclosed by Kiang because the "GTM overcomes most of the significant limitations of the SOM," therefore making the GTM application more efficient and cost effective. (Bishop, abstract)

Regarding Claim 5:

Kiang further discloses the step[s] of

transforming data from a first high-dimensional design space and from a second, different high-dimensional design space into a low-dimensional design space (This refers to the number of nodes in each dimension of the Kohonen layer. " at page 184, left column, subsection "Network Size", paragraph 1. It is further presented as the main objective of this invention that SOM networks map input data from an n-dimensional space to a lower dimensional plot ...@ abstract,

therefore it is an obvious variant that multiple high dimensional design spaces can transform

multiple forms of data into a low-dimension design space),

comparing the different transformed data sets in said low-dimensional design space and

identifying therefrom similarities between the different transformed data sets to indicate a

correspondence between the first and second high-dimensional design spaces (We fixed the

initial values of all other parameters... in the network to simplify the network process... Based on

our experience with SOM, the network parameters we selected consistently perform

satisfactorily on the following criteria: the ability to converge properly and the ability to converge

properly and the ability to produce meaningful clusters or maps." at page 184, left column,

subsection "The Gamma Parameter", paragraph 2), as claimed.

At the time the invention was made, it would have been obvious to use the technique of using

multiple (first and second) high dimension design spaces for improving the application of

transforming data in this particular instance because it is a known technique to perform multiple

transformations to provide or obtain the same desired result. This would have been obvious to

one of ordinary skill in the art. Additionally, the comparison of the multiple high dimension

design spaces is an obvious variant of the desired result to "produce proper convergence and

meaningful clusters or maps (Bishop, page 184, paragraph 2).

Regarding Claim 6:

Kiang further discloses wherein the first high-dimensional design space is a 5-dimensional

design space, the second high-dimensional design space is an 8-dimensional design space, the

third is a 14-dimensional design space, and the low-dimensional design space is a two-

dimensional design space (The main function of SOM networks is to map the input data from an

n-dimensional space to a lower dimensional (usually one to two dimensional." at Kiang, abstract). Also, "This refers to the number of nodes in each dimension of the Kohonen layer. We choose three levels of network size (n=11,15,17), all of which exceed the typical range of "anchor" points in commonly used evaluative rating scales (typically between 5 and 10)-the typical input data for factor analysis." at page 184, Section 4, "The Experimental Design", subsection "Network Size", paragraph 1).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to substitute n-dimensional design spaces, for example, 5, 8 or 14 for the first, second or third dimensional design spaces as claimed because "n" is a variable which by simple substitution would yield a predictable result. Kiang discloses that the main function is to map the data to an "n"-dimensional space, therefore the substitution of these claimed variables is an obvious variant of what is claimed and therefore would have been obvious to one of ordinary skill in the art at the time the invention was made.

Regarding Claim 8:

Kiang discloses all of the limitations of the method as rejected above at Claim 1.

Kiang does not specifically disclose [that] the value derivation is effected by generating an image map representation of the transformed data in the low-dimensional design space nor visually identifying an intersecting region in the image map representation, which intersecting region provides an indication of said value, as claimed.

Bishop teaches wherein the value derivation is effected by generating an image map

representation of the transformed data in the low-dimensional design space (Refer to page 9,

equation 21 Also refer to Figures 4 and 5; "The batch version of the SOM algorithm (Kohonen

1995) can be described as follows, A set of K reference vectors Zi is defined in the data space,

in which each vector is associated with a node on a regular lattice in a (typically) two-

dimensional 'feature map' (analogous to the latent space of GTM)." At page 9, section 4-

Relation to the Self-Organizing Map, paragraph 2, for additional details see the equation and

definitions of vectors located in the sentences following this citation on page 9, same section,

same paragraph),

and visually identifying an intersecting region in the image map representation, which

intersecting region provides an indication of said value (Refer to Figure 5...crosses, circles and

plus signs, depict intersecting regions on the image map).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art

to evaluate and use the value derivation in an image map and visually identify the intersecting

regions which provides an indication of the formally mentioned values as taught by Bishop with

the method of transformation, and other claimed elements as fully disclosed by Kiang because

the visual identification allows the user to "identify the neighboring data which directly links to

the neighborhooding function which can gradually reduce iterations", thus making the

transformation of data more efficient and cost-effective. (Kiang, page 10, paragraph 1).

15.   Claim 9 (as best understood by the Examiner) is rejected under 35 U.S.C. 103(a) as

being unpatentable over Kiang et al, "An Evaluation of Self-Organizing Map Networks as a

Robust Alternative to Factor Analysis in Data Mining Applications, (hereinafter, Kiang) in

combination with Benitz (US 6,628,844 B1).

Regarding Claim 9: (Currently Amended) Kiang discloses all of the limitations as claimed in the

rejection as stated above at claim 1 (102(b) rejection).

Kiang does not specifically disclose a method for application to an aircraft design or to an

aerodynamic surface design.

However,

Benitz teaches a method as claimed in claim 1 for application to an aircraft design or to an

aerodynamic surface design (Refer to Figure 1, specifically, numeral 20 "An airborne SAR

system is typically used to map or image a specific ground terrain (also referred to herein as a

SAR scene). As an example, FIG. 1 illustrates a SAR equipped aircraft 20 flying along a flight

path 22 monitoring a certain SAR scene 24. The SAR equipped aircraft 20 transmits a series of

RF pulses towards the SAR scene 24 and receives backscattered RF energy whose information

content is indicative of the terrain and other reflecting objects on the terrain." at column 2, line

14).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art

to use the application of transforming data from a high dimensional to low dimensional design

space as disclosed by Kiang with application to an aircraft design or to an aerodynamic surface

design because the "SAR application [method] solves some problems by employing signal

processing techniques which allow a larger antenna to be synthesized using the motion of the

radar platform (for example, an antenna mounted on an aircraft", at column 2, line 2).

Conclusion

16.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Bozkaya et al. "Distance Based Indexing for High-Dimensional Metric Spaces" SIGMOD 97, Arizona, USA-ACM, 1997, pages 357-368.

- Jimenez et al. "Supervised Classification in High-Dimensional Space: Geometrical, Statistical, and Asymptotical Properties of Multivariate Data" IEEE Transactions on Systems, Man and Cybernetics-Part C: Applications and Reviews, Volume 28, No. 1, February 1998, pages 39-54.

- Ornes et al. "A Neural Network that Visualizes What It Classifies" Pattern Recognition Letters 18 (1997), ECE Department, University of California, Irvine, pages 1301-1306.

- Kiang et al. "An Extended Self-Organizing Map Network for Market Segmentation-A Telecommunication Example" Science Direct, Decision Support Systems 42 (2006) pages 36-47.

- US Patent 5,949,914

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mia M. Thomas whose telephone number is 571-270-1583. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private

PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you

would like assistance from a USPTO Customer Service Representative or access to the

automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Mia M Thomas
Examiner
Art Unit 2624

Mia M. Thomas

VIKKRAM BALI
PRIMARY EXAMINER